

Rice Technology Bulletin

Department of Agriculture

Philippine Rice Research Institute (PhilRice)

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40kg certified seeds per hectare



Rice Technology Bulletin Series:

- | | | | |
|--------|---|--------|---|
| No. 1 | Released Rice Varieties (1968-1994) | No. 15 | Rice Tungro Virus Disease |
| No. 2 | Pagpaparami at Pagpupuro ng Binhi sa Sariling Bukid | No. 16 | The Philippine Rice Seed Industry and the National Rice Seed Production Network |
| No. 3 | Paggawa ng Maligaya Rice Hull Stove | No. 17 | 10 Hakbang sa Paggawa ng Kompost |
| No. 4 | PhilRice Micromill | No. 18 | 10 nga Addang ti Panagaramid iti Compost |
| No. 5 | PhilRice Flourmill | No. 19 | Characteristics of Popular Philippine Rice Varieties |
| No. 6 | PhilRice Drumseeder | No. 20 | Rice Stem Borers in the Philippines |
| No. 7 | PhilRice Rototiller | No. 21 | Rice Food Products (revised edition) |
| No. 8 | Rice Food Products | No. 22 | Leaf Color Chart (English) |
| No. 9 | PhilRice-UAF Batch Dryer | No. 23 | Leaf Color Chart (Ilocano) |
| No. 10 | Integrated Management of the Malayan Black Bug | No. 24 | Leaf Color Chart (Pilipino) |
| No. 11 | SG800 Rice Stripper-Harvester | No. 25 | Equipment for Rice Production and Processing |
| No. 12 | Dry Seeded Rice-Based Cropping Technologies | | |
| No. 13 | Maligaya Rice Hull Stove | | |
| No. 14 | 10 Steps in Compost Production | | |

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Foreword

Seed is the most critical factor in crop production. If we want to modernize rice agriculture in the Philippines, then we must use certified rice seeds. Based on a study conducted by PhilRice, this can result in a 10 % increase in yield as compared with farmers' home-saved seeds.

However, only 15-20 % of rice farmers use certified seeds every season. Among the reasons for this low usage include the limited seed supply, inaccessibility of seed growers, limited awareness on its potential increase in yield, poor quality of seeds sold by unscrupulous seed traders, limited opportunity for farmers to produce their own quality seeds, and the high cost of total seeds used partly owing to farmers' high seeding rate.

Most farmers use 3-4 cav or approximately 120-160 kg seeds per hectare. This is based on their belief that the more seeds sown, the greater the yield. But based on studies conducted at PhilRice and on subsequent technology demonstrations all over the country since 1995, a bag of 40 kg certified seeds is enough for one hectare. Many farmers also attest to this recommendation.

This bulletin explains how to use the 40 kg per hectare technology. It also presents why 40 kg certified seeds is enough for one hectare and the advantages of the technology. To know where to buy certified seeds of modern varieties, we have included in this bulletin a directory of the members of the National Rice Seed Production Network.

We hope that with this bulletin, our municipal agricultural technicians will be able to encourage, challenge and convince our farmers to use only 40 kg certified seeds per hectare. If farmers will use this technology, they will not only reduce their input cost but will also help save seeds for other farmers' use.


SANTIAGO R. OBIEN
Executive Director

What is a certified seed (CS)

Certified seed is the progeny of foundation or registered seeds that is so handled as to maintain satisfactory genetic identity and purity. It is produced and distributed by all accredited seed growers to farmers for commercial palay production. These seeds bear the blue tag from the Seed Quality Control Services of the Bureau of Plant Industry (SQCS-BPI) to guarantee that it passed the laboratory standard of seed purity. Based on the quality standard of certification set by the SQCS, following is the characteristic of quality seeds:

	For every 500 grams			
	<i>BS</i> sample	FS	RS	CS
Pure seed (<i>min.</i>)	99%	98%	98%	98%
Germination (<i>min.</i>)	85%	85%	85%	85%
Moisture Content (<i>max.</i>)	14%	14%	14%	14%
Weed/other crop seed (<i>max.</i>)	0	0	.05%	.10%

BS-breeder seed *FS*- Foundation *RS*- Registered *CS*- Certified seed



Why use CS

Certified seeds have at least 10% yield advantage compared with farmers' home-saved seeds. This is because:

Certified seeds have

- *High seedling vigor*, thus, better survival rate and root anchorage leading to significant higher yield advantage
- *Higher germination rate*

Farmers' home-saved seeds have

- *High percentage mixture*, since many farmers do not practice roguing.
- *Lower yield*. Potential yield of variety is not met, especially when mixtures do not synchronize with the maturity of the variety planted or when mixtures are susceptible to insect pest and diseases.
- *Low seed germination rate*. Survey of 50 farmers in Nueva Ecija and 50 farmers in Laguna showed that the samples had less than 85% germination.

Why use only 40kg CS per hectare?

Every 1,000 grains weighs an average of 24 g or 0.024 g/ grain. Thus, one kilo of rice seeds contains some 40,000 grains, that is, 40 kg of seeds is equivalent to 1.6 million grains.

If you transplant at a distance of 20 x 20 cm, a hectare would have some 250,000 hills. At two seedlings transplanted per hill, a hectare would require some 500,000 seedlings.

Thus, even if 50% of the seedlings from your 40 kg seeds did not germinate or were eaten by birds and golden snails, the remaining 50%, which is equivalent to 800,000, would still be more than enough to transplant a hectare of rice field.

Computation

$$\blacksquare \frac{40,000 \text{ grains}}{1 \text{ kg}} \times 40 \text{ kg} = 1.6 \text{ M grains}$$

$$\blacksquare \text{ planting distance} = 20 \times 20 \text{ cm}$$

$$1 \text{ ha} = \begin{array}{l} \text{a) } 250,000 \text{ hills} \end{array} \times \begin{array}{l} 2 \\ \text{seedlings/hill} \end{array} = 500,000 \text{ seedlings}$$

$$\text{b) } 250,000 \text{ hills} \times \begin{array}{l} 3 \\ \text{seedlings/hill} \end{array} = 750,000 \text{ seedlings}$$

$$\blacksquare \begin{array}{l} \text{a) } 800,000 \\ 50\% \text{ germinated} \\ \text{seeds} \end{array} - \begin{array}{l} 500,000 \\ \text{seedling req't} \\ \text{per hectare} \end{array} = 300,000 \text{ extra seedlings} \\ \text{for replanting}$$

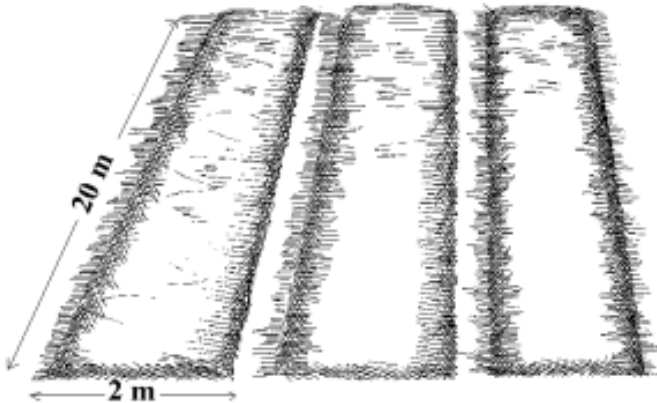
$$\text{b) } 800,000 \text{ } 50\% \text{ germinated seeds} - 750,000 \text{ seedling req't per hectare} = 50,000 \text{ extra seedlings for replanting}$$

How to use the 40kg CS per hectare technology

1. Prepare a 400 sq m seedbed.

This may be any of the following:

- 10 seedbeds at 2 m x 20 m each
- 20 seedbeds at 1 m x 20 m each
- 40 seedbeds at 2m x 5 m each



Note

- A larger seedbed will give the seeds enough “breathing space” thus, producing vigorous seedlings with more tillers and longer roots per seedling
- Too small seedbed will result in overlapping seeds and overcrowded seedlings

2. Mix organic matter on top of the seedbed

Use compost or any organic materials such as dried chicken manure, rice hull ash, or rice straw. A 400 sq m seedbed needs 200 kg or 5 cav of organic matter.



Note

- Organic materials help loosen the soil, thus:
 - it is easier to pull the seedlings and
 - it minimizes root damage

3. Broadcast the 40 kg certified seeds evenly into the seedbed

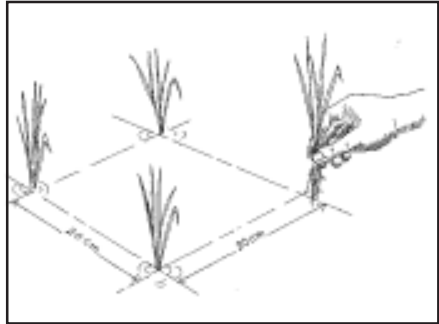
Note

- Divide the 40 kg seeds equally by the number of seedbeds.
- Broadcast approximately 1 kg per 10 sq m.



3. Transplant 1-3 seedlings per hill

Pull 20-25 day old seedlings and transplant them immediately at 1, 2, or 3 seedlings per hill. During the wet season, transplant at 20 cm x 20 cm distance between hills and 20 x 15 cm during dry season.



Note

- Each seedling would be vigorous and have 2-3 tillers at planting, thus, 1-3 seedlings per hill would already have 4-9 plants.
- Too close spacing results in shading, less tillers, and in tall plants which are susceptible to lodging.

What are the benefits of using 40kg CS per hectare

- *Savings on seed cost.* At P700/cav, the usual seeding rate of 3-4 cav costs P2,100-P2,800. Thus, if we use only 40 kg costing P700.00, we can save as much as P2,100 compared to the use of 4 cav.
- *More quality seeds for other farmers.* If farmers will use less seeds, more farmers can avail unavailable quality seeds produced by seed growers.

Where to buy CS

LUZON

State Colleges & Universities (SCUs)

1. Mariano Marcos State University, Batac, Ilocos Norte
 2. Pangasinan State University, Sta. Maria, Pangasinan
 3. Don Mariano Marcos State University, Bacnotan, La Union
 4. Ilocos Sur Polytechnic College, Sta. Maria, Ilocos Sur
 5. Isabela State University, Echague, Isabela
 6. Quirino State College, Diffun, Quirino
 7. Pampanga Agricultural College, Magalang, Pampanga
 8. Tarlac College of Agriculture, Camiling, Tarlac
 9. Central Luzon State University, Muñoz, Nueva Ecija
 10. Southern Luzon Polytechnic State College, Lucban, Quezon
 11. Laguna State Polytechnic College, Siniloan, Laguna
 12. NSF/IPB, UPLB, College, Laguna
 13. OMNC-AFC, San Jose, Occ. Mindoro
 14. SPCP, Aborlan, Palawan
 15. Bicol University-College of Agriculture, Guinobatan, Albay
 16. Camarines Norte State College, Daet, Camarines Norte
 17. DEBESMSCAT, Mandaon, Masbate
 18. Abra State Institute of Science and Technology, Lagangilang, Abra
 19. Romblon State College, Odiangan, Romblon
 20. CAIC, Panganiban, Catanduanes
- Department of Agriculture-Regional Integrated Agricultural Research Center (DA-RIARC)*

21. DA-ILIARC, Dingras, Ilocos Norte
22. DA-ILIARC, Batac, Ilocos Norte
23. DA-ILIARC, San Ildefonso, Ilocos Sur
24. DA-CVIARC, Abulug Seed Farm, Abulug, Cagayan
25. DA-CVIARC, Ilagan, Isabela
26. DA-CLIARC, Magalang, Pampanga
27. DA-Agricultural Demo Center, Naujan, Oriental Mindoro
28. DA-BIARC, Pili, Camarines Sur
29. DA-CAR, Luna, Apayao

Local Government Units (LGUs)

30. LGU, Alfonso Lista, Ifugao
31. OPAG, Puerto Princesa City
32. Kalinga Agro-Production Center, Tabuk, Kalinga
33. OPAG San Jose, Occidental Mindoro
34. OPAG, Ligao, Albay
35. Pinit Irrigator's Association, Inc., Ocampo, Camarines Sur

NGOs, Coops & Companies

36. Mr. Ben Cruz, Sanduguan, Baliuag, Bulacan
37. SUSI Foundation, Inc., Tiaong, Quezon
38. BIDTECH, Inc., Pili, Camarines Sur
39. Nueva Ecija Seed Growers Cooperative c/o Mr. Lorenzo Duqueza, Muñoz, Nueva Ecija
40. B.M.Domingo Seed Co., Aurora, Isabela
41. Engr. Bienvenido Roque, Santiago City

VISAYAS

SCUs

42. Aklan State College of Agriculture, Banga, Aklan
43. Panay State Polytechnic College, Pontevedra, Capiz
44. Central Philippines University-College of Agriculture, Iloilo City
45. Siliman University, Dumaguete City
46. Visayas State College of Agriculture, Baybay, Leyte
47. Eastern Samar State College, Borongan, Eastern Samar
48. University of Eastern Philippines, Catarman, Northern Samar

49. Biliran National Agricultural College, Biliran, Biliran
50. LNAIS, Las Navas, Northern Samar
DA-RIARC
51. DA-WESVIARC, Jaro, Iloilo
52. DA-BAI-LGNCRDC, Jalandoni Prod'n Area, La Carlota City
53. DA-BES-CENVIARC, Ubay, Bohol
54. DA-CENVIARC-SWRDS, Ubay, Bohol
55. APC-Bohol, Dao District, Tagbilaran City
56. DA-EVIARC, Babatngon, Leyte
57. DA-RIARC, Abuyog, Leyte
58. DA-EVIARC (Gandara Seed Farm), San Jorge, Western Samar
59. DA-EVIARC-LFSD, Catubig, Northern Samar
60. OPAg, Kalibo, Aklan
NGOs, Coops, & Companies
61. Iloilo Integrated Seed Growers, La Paz, Iloilo
62. KASAMA-N. N. Inc., Kabangcalan, Negros Occidental
63. A.T. Farm, Ubay, Bohol
64. Bohol Seed Growers Cooperative
65. Mr. Nonato C. Jinon, Sr., RESGAP Region VII, Canlaon City
66. ASPA, Argao, Cebu
67. PSGMPC, Pototan, Iloilo
68. L.N.Agustin Farms, Inc., Murcia & La Castellana, Negros Occidental
LGUs
69. OPAg., Siquijor, Siquijor

MINDANAO

SCUs

70. Zamboanga del Sur Agricultural College, Dumingag, Zambo del Sur
71. Katipunan National Agricultural School, Katipunan, Zambo del Norte
72. Sindangan National Agricultural School, Sindangan, Zambo del Norte
73. Central Mindanao University, Musuan, Bukidnon
74. Misamis Or. State College of Agri. and Technology, Claveria, Misamis Oriental
75. University of Southeastern Philippines, Tagum, Davao del Norte
76. Sultan Kudarat Polytechnic State College, Tacurong, Sultan Kudarat
78. University of Southern Mindanao, Kabacan, North Cotabato
79. Surigao del Sur Polytechnic College, Tago, Surigao del Sur
80. Mindanao State University, Marawi City
81. Mindanao State University, Sinsuat, Maguindanao
82. Surigao National College of Technology, Mainit, Surigao
83. South Cotabatao National Agricultural School, Surallah, South Cotabato
84. Northern Mindanao State Institute of Sci. and Technology, Ampayaon, Butuan City

DA-RIARC

85. DA-WESVIARC, Ipil, Zambo del Sur
86. DA-WESVIARC, San Miguel, Zambo del Sur
87. DA-NOMIARC, Talacogon, Agusan del Sur
88. BAF Complex, Dangcagan, Bukidnon
89. DA-SMIARC, Tupi, South Cotabato
90. DA-CEMIARC, Tacurong, Sultan Kudarat

LGUs

91. Provincial Nursery Seed Farm, Kapatagan, Lanao del Norte
92. Provincial Director, DA-ARMM, Jolo, Sulu

NGOs, Coops, & Companies

93. TFI, Koronadal, South Cotabato
94. LISIDECO, Lupon, Davao Oriental
95. CISPMCI Matalam, Cotabato
96. DOSEPCO, Banay-banay, Davao Oriental
97. CENBUCO, Valencia, Bukidnon
98. DAMSEPCO, Tagum City, Davao del Norte
99. DASUCEPCO, Digos, Davao del Sur

How to multiply one kilo of seeds

1. Mix organic matter on top of the seedbed (approx. 0.5 kg/sqm) to make pulling of seedlings easier.
2. Sow one kilogram of seeds in a 20 sqm seedbed. That would be equivalent to some 40,000 grains or 50 grams of grains per sqm.
3. After 21 to 25 days, transplant 1 to 3 seedlings per hill in a 1,000 sqm field at 20 cm x 20 cm distance during the wet season and at 20 cm x 15 cm distance during the dry season.



In fact, based from the above recommendation of 1 kg / 1,000 sqm, 10 kg of seeds is enough per hectare.

1,000 sqm or one tenth of a hectare of rice can yield at least 10 sacks, or half a ton of seeds.

Try this tip and write us about your results !

Farmers' testimony

"Yes, 40 kg is more than enough for a hectare! " claims Mr. Luna Ignacio of Bgy. Catalanacan, Muñoz, Nueva Ecija. At first, he was too reluctant to try using less than half of what he used to broadcast. He was even sleepless for several nights, worried that he would not have enough seedlings to transplant.

Mr. Ignacio was very relieved when he pulled the very vigorous seedlings which has 2-3 tillers already at 25 days. The seedlings were transplanted in a "straight kulong method" at 2-3 seedlings per hill.

*"Hindi nga ako makapaniwala noong ang dami pang sumobra.
(I can't believe it when I saw that I still have extra seedlings.)*

DA-PhilRice

The Philippine Rice Research Institute (PhilRice) is a government corporation attached to the Department of Agriculture (DA). Executive Order 1061 approved on November 5, 1985 and amended by EO 60 dated Nov. 7, 1986, created PhilRice to help develop high-yielding technologies so that farmers can produce enough rice for all Filipinos. PhilRice accomplishes this mission through research, development, and extension, which are implemented through a network that includes 56 agencies and 98 seed centers strategically located nationwide.

Its interdisciplinary programs include the following: (1) direct-seeded and (2) transplanted irrigated lowland rice; (3) hybrid rice; (4) rice for adverse environments; (5) rice-based farming systems; (6) rice and rice-based products; (7) policy research and advocacy; and (8) technology promotion. With these programs, PhilRice aims to develop and promote technologies that are ecosystem-based, location- and problem-specific, and profitable to the Filipino farmers.

*for more information,
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DA-PhilRice

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